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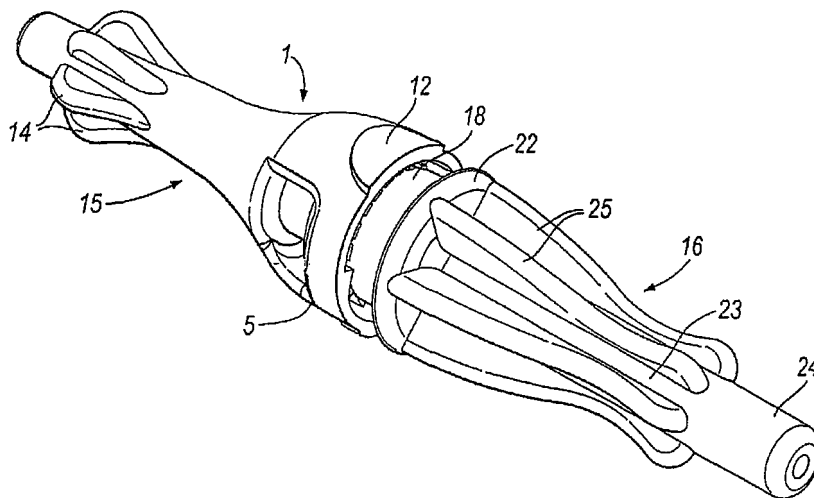
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[Continued on next page]

(54) Title: COUPLING FOR MEDICAL FLUID DELIVERY SYSTEMS



(57) Abstract: A coupling for a medical fluid delivery system for administering liquids to a patient includes male and female members, the female member (1) having an inwardly tapering socket (3) for receiving a complimentary tubular spigot (17) of the male member and having a liquid escape vent (9) for escape of liquid supplied from an incorrect or an incorrectly coupled male member. A collar (18) of the male member is threadedly engageable with a hub (2) of the female member for securing the members against disengagement, and the female member has a sleeve (5) with a pawl (6) which cooperates with ratchet teeth (20) on the collar to lock the collar against answering, the pawl being disengageable by squeezing the sleeve (5). The sleeve (5) has openings (8) to permit treatment of the hub and sleeve interior for destroying bacteria. The male member may be provided at the forward end of a syringe (34). The male and female members have in their gripping regions similar external profiles defined by radial wings (14, 25, 39) to provide a clear tactile indication that the correct parts are being used together.



**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(88) Date of publication of the international search report:**

8 May 2003

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/AB 02/04008

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61M39/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 633 039 A (STERIMED GMBH) 11 January 1995 (1995-01-11) figures 1,2	1-3
A	US 6 217 564 B1 (KERR JAMES WILLIAM ET AL) 17 April 2001 (2001-04-17) the whole document	1-3
X	column 3, line 57 -column 4, line 40; figures 1-3	4-15,17
A	EP 1 050 318 A (SAF T MED INC) 8 November 2000 (2000-11-08) column 2, line 50 -column 3, line 19; figures 5,7 column 4, line 46-51	4-15,17
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

21 February 2003

Date of mailing of the international search report

07 MAR 2003

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT 02/04008

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 37356 A (PETERS JOSEPH LENNOX) 29 July 1999 (1999-07-29) page 3, line 14 -page 5, line 18; figures 1-3 ---	4-15,17
A	GB 2 131 510 A (GILSTON ALAN) 20 June 1984 (1984-06-20) the whole document -----	4-15,17

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 02/04008

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: 19-22  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
1-15, 17
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-3

Female coupling member for a medical fluid delivery system, the coupling member comprising a hub with a socket recess having an open end and an interior surface tapering inwardly from the open end and a liquid escape vent open at the tapering surface adjacent the open end.

2. Claims: 4-15,17

Male coupling member for a medical fluid delivery system, the coupling member comprising a tubular spigot, a collar coaxially surrounding the spigot, a screw thread on the interior of the spigot and a large number of ratchet teeth disposed around the exterior of the collar, the same claims also essentially defining a coupling comprising said male coupling member and a female coupling member with a hub having a socket with a sealing surface tapering axially inwardly from the open end, the female member having a sleeve surrounding the hub and comprising a pawl element provided on the inner surface of the sleeve.

3. Claim : 16

Female coupling member for a medical fluid delivery system, the coupling member having a hub with a socket, a securing member on the exterior of the hub, a sleeve surrounding the hub and comprising an opening and a locking pawl on the interior of the sleeve.

4. Claim : 18

Stylet holder for use with a female coupling member of claims 1-5 or 16, the holder having a rear face with radial lugs protruding axially therefrom.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 02/04008

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 19-22

The reference to the description and drawings renders the subject matter of claims 19-22 totally unclear.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 02/04008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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			JP 2002500935 T	15-01-2002
			US 6508807 B1	21-01-2003
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# RESERVED COPY PATENT SPECIFICATION

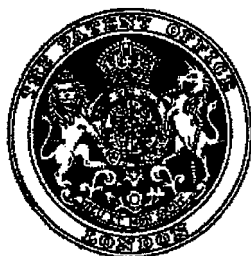
735,202

Inventor:—RUDOLF WINTER.

Date of filing Complete Specification : Feb. 23, 1954.

Application Date : Feb. 26, 1953. No. 5380/53.

Complete Specification Published : Aug. 17, 1955.



Index at Acceptance :—Class 81(2), B15C4.

## COMPLETE SPECIFICATION.

### Improvements in Means for Fixing Injection Needles to Hypodermic Syringes.

We, SORDENT MANUFACTURING COMPANY LIMITED, a British Company, of Angel Factory Colony, Edmonton, London, N.18, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with hypodermic syringes and particularly with means for connecting injection needles to hypodermic syringes.

At present a conventional hypodermic syringe for what may be called simple injection is provided with a tapering nozzle on to which a needle may be pushed so as to be retained in position by friction between the two surfaces. This is satisfactory for simple injection in, for example, the arm, since if the needle should remain in the patient after injection it is a simple matter to remove it. For more complicated injections however the present technique demands special syringes and needles to prevent the possibility of the needle being left in the patient when the syringe is withdrawn. Among many special syringes there are lachrymal syringes, laryngeal syringes, haemorrhoidal syringes and many others. At present there is also a wide variety of needles and also a number of different methods by which the needles may be secured to a special syringe, for example by screw threaded means, by internal or external bayonet joints and by other methods.

It will be understood therefore that present practice requires special needles for many different purposes, special syringes and also special means for securing needles to the syringes and a needle which may be designed for one syringe very often cannot be used with another syringe because the fixing means may be different. All this has introduced

considerable complication into injection technique. Hospitals, doctors and all concerned with medical science have to provide themselves with a whole range of apparatus. This is an unnecessary and an expensive complication.

It is well understood that many different sizes of syringe are required and it is also necessary to have many different needles in the sense, for example, that needles of large gauge and needles of small gauge are required. Straight needles and curved needles are also required but it is not necessary to have a wide variety of fixing means. It is however appreciated that syringes with a range of nozzle size or fitting have to be provided for different purposes. An object of the present invention is, therefore, to provide an improved means of fixing needles to syringes so that, broadly speaking, by means of the present invention, any standard needle may be fitted to any syringe of the appropriate nozzle fitting. It is a further object of the present invention to provide improved fixing means as referred to such that it is substantially impossible accidentally for the needle to become separated from the syringe.

According to a feature of the present invention we provide a hypodermic syringe comprising a nozzle having a screw thread formed thereon and a locking nut in engagement with the screw thread, projecting lugs being provided on the nut to grip shoulders on a standard injection needle to hold the needle positively in position on the syringe.

In more detail the invention includes a hypodermic syringe assembly in which a standard needle is secured on the syringe by engagement of shoulders on the needle with a locking nut on the syringe nozzle.

In order that the invention may be clearly understood and readily carried into effect, reference is now directed to the accompany-

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ing drawings given by way of example in which:—

Figure 1 is a side elevation of one end of a hypodermic syringe constructed according to the invention with a locking nut ready for engagement therewith.

Figure 2 shows a standard needle for co-operation with the syringe and locking nut shown in Figure 1.

Figure 3 shows the same needle turned through 90°.

Figure 4 is a side elevation of one end of an assembled syringe with a needle in secured position; and

Figure 5 is a section on 5—5 of Figure 4 to an enlarged scale.

Figure 6 is a side elevation of one end of an assembled syringe with a needle ready for removal; and

Figure 7 is a section on 7—7 of Figure 6 to an enlarged scale.

In the drawings a syringe is provided with a cylindrical glass or like body 1 having a metal cap 2 at the outlet end, the cap being provided with a normal projecting nozzle 3 with an orifice therein. At the base of the nozzle 3 where it joins the cap 2, a surrounding external screw-thread 4 is provided. An internal threaded locking nut 5 is provided for engagement with this external screw-thread 4. The locking nut 5 is of substantially cylindrical form and is provided with a knurled or serrated outer surface. When the locking nut 5 is screwed fully on to the screw-thread 4, the nozzle 3 of the syringe projects outwardly through the end of the locking nut 5. The locking nut 5 is provided with two projecting lugs 6 at the outer end which extend towards the nozzle orifice. These lugs 6 are slightly turned inwards for gripping purposes.

A needle 7 for use with the improved syringe is provided with a shoulder 8 on the mount thereof. The mount of the needle is flattened at 9 on two diametrically opposed sides and is provided with the shoulders 8 on the two other diametrically opposed sides so that the mount of the needle is of elongated form see Figures 2—3 being flattened on two sides and projecting on two other sides. To insert the needle 7 into position on the syringe the locking nut 5 should be partially unscrewed. The mount of the needle 1 is then pushed over the nozzle 3 with the flattened portions 9 of the mount passing between the outside of the nozzle 3 and the inside of the projecting lugs 6 on the locking nut 5 see Figures 6 and 7. If the needle 7 be then turned through approximately 90° the shoulders 8 on the needle pass under the intumed lugs 6 see Figures 4 and 5. The needle 7 may then be positively secured in position by screwing the locking nut 5 tightly down against the metal cap 2. In order to remove the needle the

locking nut 5 may be unscrewed and this will have the effect of pushing the needle off the nozzle 3.

It will be understood that when in position and secured, a needle 7 is firmly held in place on the syringe by the locking nut 5 and that it is substantially impossible for a needle 7 to be left in a patient's body when the syringe is withdrawn.

The method of mounting an injection needle 7 on a hypodermic syringe may, therefore, be used not only for the most simple form of hypodermic injection but also for all kinds of more complicated injections. While different sizes of syringes and needles may be required, the mount of each needle may be identical in shape so that any needle by means of the present invention may be fitted to any syringe of the appropriate nozzle fitting.

The underlying idea of the present invention is therefore to provide every syringe with a substantially identical fixing means, including a screw-threaded nozzle with a locking nut in engagement therewith and to provide every needle with a substantially identical mount having projecting shoulders to engage under lugs on the locking nut.

In point of fact the needle for co-operation with the fixing means is simply a standard form of needle as now manufactured for frictional engagement with a nozzle, the aim of the invention being to provide means whereby the standard form of needle may be positively secured in position on the needle without having to modify the needle in any way.

What we claim is:—

1. A hypodermic syringe comprising a nozzle having a screw thread formed thereon and a locking nut in engagement with the screw thread, projecting lugs being provided on the nut to grip shoulders on an injection needle to hold the needle positively on the syringe.

2. A hypodermic syringe comprising a glass or like cylinder with an externally threaded nozzle and an internally threaded locking nut with gripping lugs for co-operation with an injection needle shaped at its base so that it is flattened on two diametrically opposed sides and that it has a shoulder on each of its other sides whereby the needle may be held in position by the locking nut when the shoulders are under the lugs and may be removed when the shoulders are not under the lugs.

3. A hypodermic syringe substantially as hereinbefore described with reference to the accompanying drawings.

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## PROVISIONAL SPECIFICATION.

**Improvements in Means for Fixing Injection Needles to Hypodermic Syringes.**

We, SURDENT MANUFACTURING COMPANY LIMITED, a British Company, of Angel Factory Colony, Edmonton, London, N.18, do hereby declare this invention to be described in the following statement:—

This invention is concerned with hypodermic syringes and particularly with means for connecting injection needles to hypodermic syringes.

At present a conventional hypodermic syringe for what may be called simple injection is provided with a tapering nozzle on to which a needle may be pushed so as to be retained in position by friction between the two surfaces. This is satisfactory for simple injections in, for example, the arm, since if the needle should remain in the patient after injection it is a simple matter to remove it. For more complicated injections however the present technique demands special syringes and needles to prevent the possibility of the needle being left in the patient when the syringe is withdrawn. Among many special syringes there are lachrymal syringes, laryngeal syringes, haemorrhoidal syringes and many others. At present there is also a wide variety of needles and also a number of different methods by which the needles may be secured to the special syringes, for example by screw-threaded means, by internal or bayonet joints and by other methods.

It will be understood, therefore that present practice requires special needles for many different purposes, special syringes and also special means for securing needles to the syringes and a needle which may be designed for one syringe very often cannot be used with another syringe because the fixing means may be different. All this has introduced considerable complication into injection technique. Hospitals, doctors and all concerned with medical science, have to provide themselves with a whole range of apparatus. This is an unnecessary and an expensive complication.

It is well-understood that many different sizes of syringe are required and it is also necessary to have many different needles in the sense that the point of the needle and the gauge may be larger or smaller or longer or may be curved as the case may be, but it is not necessary to have a wide variety of fixing means. It is however appreciated that syringes with a range of cone size or fitting have to be provided for different purposes. An object of the present invention is, there-

fore, to provide an improved means of fixing needles to syringes so that, broadly speaking, by means of the present invention, any needle may be fitted to any syringe of the appropriate cone fitting. It is a further object of the present invention to provide improved fixing means as referred to such that it is substantially impossible accidentally for the needle to become separated from the syringe.

According to the present invention we provide a hypodermic syringe with a nozzle having a screw-thread formed thereon, a locking nut being in engagement with the screw thread and having projecting lugs shaped to grip a needle and to hold it positively in position on the syringe.

In one embodiment constructed according to the invention, the syringe may be provided with a cylindrical glass or like body having a metal cap at the outlet end, the cap being provided with a normal projecting nozzle with an orifice therein. At the base of the nozzle where it joins the cap, a surrounding external screw-thread is provided. An internal threaded locking nut is in engagement with this external screw-thread. The locking nut is preferably of substantially cylindrical form and is provided with a knurled or serrated outer surface. When the locking nut is screwed fully on to the screw-thread, the nozzle of the syringe projects outwardly through the end of the locking nut. The locking nut is provided with two projecting lugs at the outer end which extend towards the nozzle orifice. These lugs are slightly turned inwards for gripping purposes.

A needle for use with the improved syringe is provided with a shoulder at the base thereof. The base of the needle is flattened on two diametrically opposed sides and is provided with a shoulder on two other diametrically opposed sides so that the base of the needle is of elongated form being flattened on two sides and being projecting on two other sides. To insert the needle into position on the syringe the locking nut should be partially unscrewed. The base of the needle is then pushed over the nozzle with the flattened portions of the base passing between the outside of the nozzle and the inside of the projecting lugs on the locking nut. If the needle be then turned through approximately 90° the shoulders on the needle pass under the in-turned lugs. The needle may then be posi-

tively secured in position by screwing the locking nut tightly down against the metal cap. In order to remove a needle the locking nut may be unscrewed and this will have the effect of pushing the needle off the nozzle.

It will be understood that when in position and secured, a needle is firmly held in place on the syringe by the locking nut and that it is substantially impossible for a needle to be left in a patient's body when the syringe is withdrawn.

This method of mounting an injection needle on a hypodermic syringe may, therefore be used not only for the most simple form of hypodermic injection but also for all kinds of more complicated injections. While different sizes of syringes and needles

may be required the mount or base of each needle may be identical so that any needle by means of the present invention may be fitted to any syringe of the appropriate cone fitting.

The underlying idea of the present invention is therefore to provide every syringe with a substantially identical fixing means, including a screw-threaded nozzle with a locking nut in engagement therewith and to provide every needle with a substantially identical mount having projecting shoulders to engage under lugs on the locking nut.

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Agents for the Applicants.

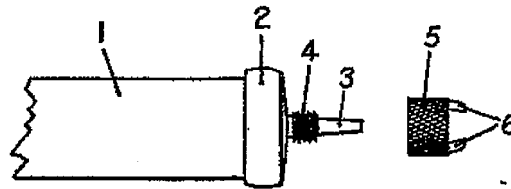


FIG. 1

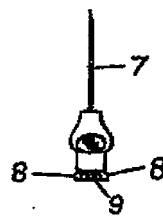


FIG. 2

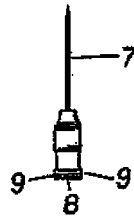


FIG. 3

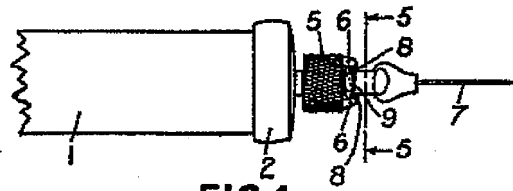


FIG. 4

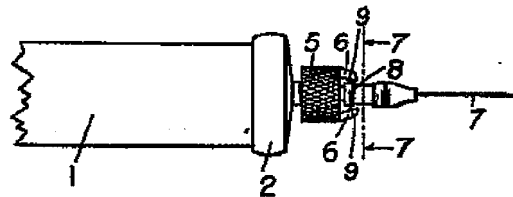


FIG. 6

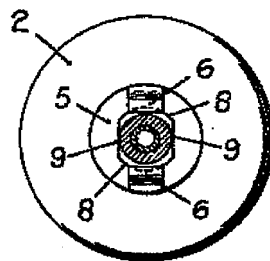


FIG. 5

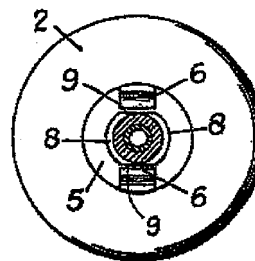


FIG. 7